Please enter the amendments below and consider the following remarks.

In the claims:

Please cancel Claims 1-15 and 21 without prejudice or disclaimer to Applicants' right to pursue the subject matter of this claim in one or more continuation, continuation-in-part, or divisional applications.

Please add the following claims:

1 ~~22.~~ A microfluidic device comprising:

i) a first microchannel;

ii) at least a first entrance port and at least a first exit port for the transportation of at least one test sample;

iii) a fluid propelling component that controls the flow rate of said test sample;

iv) a detector that detects a binding pair in said test sample; and

B1

v) a recirculating arm that recirculates said test sample back into said first microchannel;

wherein said first microchannel comprises a plurality of spacially distinct regions upon which specific binding pair members are immobilized.

2

~~23.~~ 1 A microfluidic device according to claim ~~22~~ wherein said first microchannel is serpentine.

3

~~24.~~ 11 A microfluidic device according to claim ~~22~~ further comprising at least one valve in said

12

B

exit port.

4 1.
25. A microfluidic device according to claim ~~22~~ wherein said first microchannel branches into multiple second microfluidic channels each of which comprises a plurality of spacially distinct regions upon which specific binding pair members are immobilized.

5 1 or 4
9/19/01 26. A microfluidic device according to claim ~~22 and 25~~ wherein said device is fabricated from a material selected from the group consisting of silicon, silicon dioxide, glass, plastic and ceramic.

B1 cont'd 6 1
27. A microfluidic device according to claim ~~22~~ wherein said spacially distinct regions comprise porous polymers.

7 1
28. A microfluidic device according to claim ~~22~~ wherein each of said spacially distinct regions has a different immobilized specific binding pair member.

8 6
29. A microfluidic device according to claim ~~27~~ wherein said porous polymer is a hydrogel pad.

9 8
30. A microfluidic device according to claim ~~29~~ wherein said hydrogel pad is a patterned gel

pad further comprising spatially separated portions within said hydrogel pad.

10 1
~~31~~. A microfluidic device according to claim ~~22~~ wherein said spacially distinct regions in said microchannel comprise beads with said immoblized binding pair members.

11 1
~~32~~. A microfluidic device according to claim ~~22~~ wherein said spacially distinct regions comprise microstructures fabricated into said microchannel.

12 11
~~33~~. A microfluidic device according to claim ~~32~~ wherein said microstructures comprise a series of columns molded into said first microchannel.

Bi Cont

13 11
~~34~~. A microfluidic device according to claim ~~32~~ wherein said microstructures comprise domes molded into said first microchannel.

14 1
~~35~~. A microfluidic device according to claim ~~22~~ wherein said specific binding pair members are nucleic acids.

15 14
~~36~~. A microfluidic device according to claim ~~35~~ wherein said nucleic acid is a DNA.

16 14
~~37~~. A microfluidic device according to claim ~~35~~ wherein said nucleic acid is a RNA.

14

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17 1
~~38~~. A microfluidic device according to claim ~~22~~ wherein said specific binding pair members are proteins.

18 17
~~39~~. A microfluidic device according to claim ~~38~~ wherein said proteins are antigens.

19 17
~~40~~. A microfluidic device according to claim ~~38~~ wherein said proteins are antibodies.

20 1
~~41~~. A microfluidic device according to claim ~~22~~ wherein said fluid propelling component comprises a pressurized gas, a vacuum, an electrical field, a magnetic field or a centrifugal force.

B1 Cont'd

21 1
~~42~~. A microfluidic device according to claim ~~22~~ wherein said detector is an optical, electrical or electrochemical detector.

22
~~43~~. A method of detecting a specific binding member in a test sample, said method comprising:

1 2
i) passing said test sample through the microfluidic device described in claims ~~22~~, ~~23~~ or 4
~~25~~ to form a binding pair ;

ii) detecting said binding pair.

23 19
~~44~~. A method according to claim ~~40~~ wherein said test sample is recirculated prior to said detecting.

B' Cont 24 43 22 the
~~45~~. A method according to claim ~~39 and 43~~ wherein ~~the~~ flow rate of said test sample is adjusted using ~~said~~ said fluid propelling component to allow maximum contact between said binding pairs.

a 9/19/01

REMARKS

Applicants gratefully acknowledge the withdrawal of the 35 U.S.C.§ 112 rejections.

Claims 1-15 and 21 have been canceled. Claims 22-45 have been added.

Support for claim 22, 43 and 45 can be found in the specification on page 5, lines 10-20.

Support for claims 23, 27, 35 and 36 can be found in the specification on page 8, lines 1-4.

Support for claims 24 and 44 can be found in the specification on page 7, lines 8-9.

Support for claims 25, 28 and 31 can be found in the specification on page 8, lines 20-22.

Support for claim 26 can be found in the specification on page 7, lines 11-14.

Support for claim 29 can be found in the specification on page 8, lines 4-5.

Support for claim 30 can be found in the specification on page 8, lines 9-10.

Support for claims 32, 33and 34 can be found in the specification on page 8, lines 12-15.

Support for claims 35, 36, 37, 38, 39and 40 can be found in the specification on page 2, lines 10-13.